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10/563,868	01/09/2006	Hitoshi Okazaki	396.45781X00	5301

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EXAMINER	
EOFF, ANCA	

ART UNIT	PAPER NUMBER
1709	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/563,868	OKAZAKI ET AL.	
	Examiner	Art Unit	
	Anca Eoff	1709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/9/2006, 2/2/2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/9/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

1. Claims 1-24 are pending in the application.

Claims 15, 17, 18, 20, 23 and 24 are "product-by-process" claims. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (MPEP 2113)

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

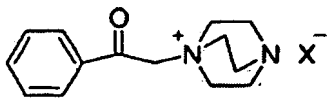
3. Claims 1-8 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amagai et al. (US Patent 5,807,975) in view of Tachi et al. ("Photochemical Reactions of Quaternary Ammonium Dithiocarbamates as Photobase Generators and Their Use in the Photoinitiated Thermal Crosslinking of Poly(glycidyl methacrylate)").

With regard to claim 1, Amagai et al. (US Patent 5,807,975) disclose alkyl sulfide type episulfide compounds with thiirane rings (see formula (I) in column 3). These

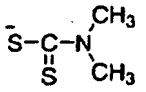
compounds can be polymerized/cured in the presence of a curing catalyst to prepare an optical material. In this polymerization, any of the known curing catalysts for epoxy resins can be used (column 9, lines 51-57).

However, Amagai et al. fail to disclose the photobase generators of formula (1) in claim 1 of the instant application used for the polymerization/curing of the episulfide compounds.

Tachi et al. disclose a process of curing poly(glycidylmethacrylate) and the use of quaternary ammonium salts of formula (I) as photobase generators:



(I),

where X^- is  (dimethyldithiocarbamate), Br^-, Ph_4B^- (tetraphenylborate), SCN^- (thiocyanate), F_4B^- (tetrafluoroborate) (page 1331, figure 1).

The quaternary ammonium salts of formula (I) meet the limitations for the photobase generator of formula (1) in claim 1 of the instant application, where Ar is phenyl, R is hydrogen and A^+ is 1,4-diazobicyclo (2.2.2) octane.

The quaternary ammonium salt represented by formula (I), where X^- is a dimethyldithiocarbamate anion is good photobase generator and acts as effective photoinitiated thermal crosslinker for poly(glycidylmethacrylate) films (page 1341, Summary).Also, the quaternary ammonium salt of formula (I) , where X^- is a tetraphenylborate anion produces the photochemical insolubilization of poly(glycidylmethacrylate) (page 1340).

Therefore, it would have been obvious for one of ordinary skill in the art to use the quaternary ammonium salts disclosed by Tachi et al. as curing catalysts/photobase generators for the episulfide compounds with thiirane rings of Amagai et al., based on Amagai's teachings that any curing catalyst used for curing epoxy products can be used to cure the episulfide compounds (Amagai et al., column 9, lines 54-56).

With regard to claims 2 and 3, Tachi et al. disclose the photobase generators of formula (I) above and these photobase generators meet the limitations of claims 2 and 3 because Ar is an unsubstituted phenyl and the anion X^- can be a borate compound, such as Ph_4B^- or F_4B^- (figure 1 on page 1331).

With regard to claims 4-6, Amagai et al. disclose that the episulfide compounds have the structures of formulas (3) and (4) of the instant application.

Amagai et al. disclose that the alkyl sulfide type episulfide compounds have the general formula :

where, X is S or O, m is an integer of 1 to 6 and n is an integer from 0 to 4 (column 3, lines 5-13).

Amagai et al. specifically disclose preferred compounds with X=S, n is an integer of 0 to 2 and m is an integer of 2 to 4 (column 4, lines 23-60).

Amagai et al. specifically disclose the compound having the formula:

(column 4, line 50) which meets the limitation of claim 6 of the instant application, with m,n=0.

Amagai et al. teach that values of n,m above 4 deteriorate the heat resistance and the refractive index of the optical material obtained by curing/polymerization (column 3, lines 63 – column 4, line 3).

With regard to claim 7,Tachi et al. further disclose that the quaternary ammonium salt of formula (I) with N,N-dimethyldithiocarbamate anion is soluble in organic solvents such as water, alcohols, THF (tetrahydrofuran), chloroform and DMF (page 1341, Summary). Tachi et al. further disclose a curing process of poly(glycidylmethacrylate) using quaternary ammonium salts of formula (I) as curing catalyst/photobase generator, the curing process taking place in THF or chloroform (page 1335).

With regard to claims 8 and 15-17, Amagai et al. teach that the episulfide compounds can be polymerized/cured in the presence of a curing catalyst to prepare an optical material. In this polymerization, any of the known curing catalysts for epoxy resins can be used (column 9, lines 51-57). Amagai et al. fail to disclose a method of curing using UV rays.

Tachi et al. disclose a process of curing of poly(glycidylmethacrylate) using quaternary ammonium salts of formula (I) as curing catalyst/photobase generator to form an insoluble film, said curing process taking place in THF or chloroform with 254 nm. radiation (page 1340).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the quaternary ammonium salts disclosed by Tachi et al. as curing catalysts/photobase generators for the episulfide compounds with thiirane rings of Amagai et al. in a process of curing with UV rays, based on Amagai's teachings that

any curing catalyst used for epoxy products can be used to cure the episulfide compounds (Amagai et al., column 9, lines 54-56).

4. Claims 9 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amagai et al. (US Patent 5,807,975) in view of Tachi et al. ("Photochemical Reactions of Quaternary Ammonium Dithiocarbamates as Photobase Generators and Their Use in the Photoinitiated Thermal Crosslinking of Poly(glicidyl methacrylate)" as applied to claims 1 and 7 and in further view of Amagai et al. (US Patent 5,945,504).

With regard to claims 9, 18, 19 and 20, Amagai modified by Tachi teach the curable compositions of claims 1 and 7 above and a method of curing an episulfide compound with quaternary ammonium salts of formula (I) as curing catalyst/photobase generator using UV radiation for curing (see paragraph 3 of the Office Action) but fail to disclose that the curing process occurs in the absence of air.

Amagai et al. (US Patent 5,945,504) disclose a process of curing episulfide compounds in the presence of a curing catalyst in order to obtain an optical material. Before or after all the materials are mixed, a degassing operation may take place under reduced pressure in order to prevent the formation of air bubbles during the curing process (column 14, lines 63-67).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to apply the teaching of Amagai et al.('504) and perform the process of modified Amagai in the absence of air, in order to prevent the formation of air bubbles during the curing process (Amagai et al, column 14, lines 63-67).

5. Claims 10-12 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amagai et al. (US Patent 5,807,975) in view of Tachi et al. ("Photochemical Reactions of Quaternary Ammonium Dithiocarbamates as Photobase Generators and Their Use in the Photoinitiated Thermal Crosslinking of Poly(glicidyl methacrylate)") as applied to claims 1 and 7 and in further view of Torigoe et al. (JP 11-071521).

With regard to claims 10-11 and 21-22, Amagai modified by Tachi teach the curable composition of claims 1 and 7 above (see paragraph 3 of the Office Action) but fail to disclose the presence of a modified silicone oil and a silane coupling agent in the curable composition.

Amagai et al. disclose that an internal/external release agent can be added to the composition for the purpose of improving the mold release characteristics of the cured material from the mold (column 12, lines 30-34).

Torigoe et al. disclose a mold-releasing composition comprising a reactive silane and modified silicone oil (silanol-modified, carboxy-modified, amino-modified), said composition having good lubricity, mold-releasing properties and heat resistance (abstract).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to include the mold-releasing agent of Torigoe et al. in the modified composition of Amagai et al., in order to insure good lubricity and mold-releasing properties (Amagai et al, column 12, lines 30-34 and Torigoe et al., abstract).

With regard to claims 12 and 23, Amagai modified by Tachi and Torigue teach the composition of claim 10 above and Tachi et al. also teach that the curing process takes place under UV irradiation (page 1335).

6. Claims 13 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amagai et al. (US Patent 5,807,975) in view of Tachi et al. ("Photochemical Reactions of Quaternary Ammonium Dithiocarbamates as Photobase Generators and Their Use in the Photoinitiated Thermal Crosslinking of Poly(glicidyl methacrylate)"), and Torigoe et al. (JP 11-071521), as applied to claim 10 above and in further view of Amagai et al. (US Patent 5,945,504).

Amagai modified by Tachi and Torigue teach the composition of claim 10 above (see paragraph 5 of Office Action) but fail to disclose that the composition cures in the absence of air.

Amagai et al. (US Patent 5,945,504) disclose a process of curing episulfide compounds in the presence of a curing catalyst in order to obtain an optical material. Before or after all the materials are mixed, a degassing operation may take place under reduced pressure in order to prevent the formation of air bubbles during the curing process (column 14, lines 63-67).

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to apply the teaching of Amagai et al. and perform the process of curing the composition of modified Amagai in the absence of air, in order to prevent the formation of air bubbles during curing (Amagai et al, column 14, lines 63-67).

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Amagai et al. (US Patent 5,807,975) in view of Tachi et al. ("Photochemical Reactions of Quaternary Ammonium Dithiocarbamates as Photobase Generators and Their Use in the Photoinitiated Thermal Crosslinking of Poly(glicidyl methacrylate)") and Torigoe et al. (JP 11-071521), as applied to claim12 above and in further view of Ishii et al. (US Pg-Pub 2003/0195270).

Amagai modified by Tachi and Torigoe teach the composition of claim 12 (see paragraph 5 above) but fail to disclose a coating composition on a surface.

Amagai et al. also teach that the material obtained by polymerizing/curing the episulfides with thiirane rings is desirable as an optical material for lens for spectacles (abstract). The episulfides can provide resinous optical materials having a sufficiently high refractive index and a good balance between the refractive index and the Abbe's number as well as high heat resistance (column 21, lines 36-44).

Ishii et al. teach that materials with high refractive index can be used for optical materials such as spectacle lens, prisms, optical fibers but also as coating layers (par.0002). The above mentioned materials could be injected in a mold and cured, can be applied on substrates such as glass or plastic or interposed between two substrates (par.0119).

It would have been obvious for one of ordinary skill in the art to use the composition of modified Amagai in the process taught by Ishii et al., since the curable composition of modified Amagai et al. has sufficiently high refractive index, good

balance between the refractive index and the Abbe's number and high heat resistance (Amagai et al., column 21, lines 36-42).

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AE

Barbara Gilliam

BARBARA GILLIAM
PRIMARY EXAMINER